MITSUBISHI ELECTRIC

General-Purpose AC Servo

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO-J4

Conversion unit for SSCNET of MR-J2S-B

MR-J4-T20

Installation Guide

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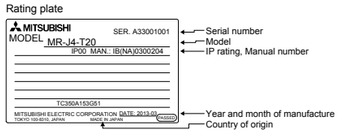
Rating plate



1. About the installation guide

1.1 MELSERVO MR-J4 relevant manuals

This installation guide explains how to mount MR-J4-T20.
If you have any questions about the operation of the equipment described in this guide, contact your local sales office.
In addition, when you mount a protective device, specific technical skills which are not detailed in the guide will be required.

1.2 Purpose of this guide

This installation guide explains the safe operation of MR-J4-_B_-RJ020 servo amplifier for engineers of machinery manufacturers and machine operators. For detailed information of the products, refer to "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual".

2. About safety

This chapter explains safety of users and machine operators. Please read the chapter carefully before mounting the equipment. In this installation guide, the specific warnings and cautions levels are classified as follows.

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

2.1 Professional engineer

Only professional engineers should mount MR-J4-T20.
Here, professional engineers are persons who have taken proper engineering training.
Please note if you can take proper engineering training at your local Mitsubishi Electric office. Contact your local sales office for schedules and locations.

2.2 Correct use

Always use MR-J4-T20 within specifications (voltage, temperature, etc. Refer to chapter 7 of this installation guide for details.).
Mitsubishi Electric Co. accepts no claims for liability if the equipment is used in any other way or if modifications are made to the device, even in the context of mounting and installation.

2.2.1 Selection of peripheral equipment and wire

For selection example of MCCB, fuse, and wires for MR-J4-_B_-RJ020 servo amplifiers, refer to "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual".
MR-J4-T20 has a part for grounding on the frame (FG). Fix the metal part FG of MR-J4-T20 with a screw to ground.

2.2.2 EU compliance

The MR-J4-_B_-RJ020 servo amplifiers are designed to comply with the following directions to meet requirements for mounting, using, and periodic technical inspections: EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC).

(1) EMC requirement
MR-J4-_B_-RJ020 servo amplifiers comply with category C3 in accordance with IEC/EN 61800-3. As for I/O wires (max. length 10 m) and encoder cables (max. length 50 m), connect them to a shielded grounding. Use an EMC filter and surge protector on the primary side. The following shows recommended products.
EMC filter: Soshin Electric HF3000A-UN series
Surge protector: Okaya Electric Industries RSPD-250-U4 series
- MR-J4 Series are not intended to be used on a low-voltage public network which supplies domestic premises;
- radio frequency interference is expected if used on such a network.
The installer shall provide a guide for Installation and use, including recommended mitigation devices.

(2) For Declaration of Conformity (DoC)
Hereby, MITSUBISHI ELECTRIC EUROPE B.V., declares that the servo amplifiers are in compliance with the necessary requirements and standards (2004/108/EC and 2006/95/EC). For the copy of Declaration of Conformity, contact your local sales office.

2.2.3 Compliance with global standards

MR-J4-T20 complies with the following global standards.

Servo amplifier	CE
MR-J4-T20	○

2.3 General cautions for safety protection and protective measures

Observe the following items to ensure proper use of the MR-J4-_B_-RJ020 servo amplifiers.

(1) Only qualified personnel and professional engineers should perform system installation.

(2) When mounting, installing, and using the MR-J4-_B_-RJ020 servo amplifier, always observe standards and directives applicable in the country.

(3) The MR-J4-_B_-RJ020 servo amplifiers fulfill the requirements to conducted emissions at the main connections in the frequency range from 150 kHz to 30 MHz. (Bases for the evaluation: Product standard IEC/EN 61800, adjustable speed electrical power drive systems, Part 3: EMC)

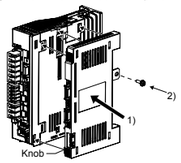
2.4 Disposal

Disposal of unusable or irreparable devices should always occur in accordance with the applicable country-specific waste disposal regulations. (Example: European Waste 16 02 14)

3. Mounting/dismounting

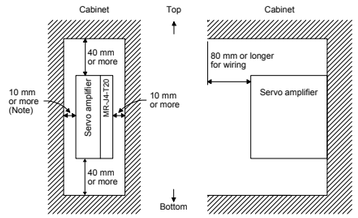
⚠ CAUTION	●The devices must be installed in the specified direction. Not doing so may cause a malfunction. ●Mount the servo amplifier on a cabinet which meets IP54 in the correct vertical direction to maintain pollution degree 2.

The following shows an example of MR-J4-200B(4)-RJ020 or less, and MR-J4-350B-RJ020. For others, refer to "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual".



1) Remove the cap of CN7 and CN9 connectors of the servo amplifier, and push the four corners of the side of MR-J4-T20 simultaneously to the servo amplifier until the four knobs click so that CN7 and CN9 connectors are connected straight.

2) Tighten the metal part FG with the enclosed installing screw (M4).

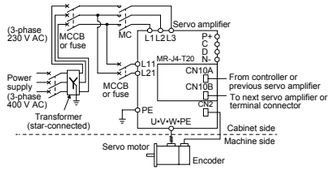


Note. For the MR-J4-500B-RJ020 servo amplifier, the clearance between the left side and wall will be 25 mm or more.

4. Electrical Installation and configuration diagram

⚠ WARNING	●Turn off the molded-case circuit breaker (MCCB) to avoid electrical shocks or damages to the product before starting the installation or wiring.

The following shows a representative configuration example.
For 3-phase 230 V AC input



5. Maintenance and service

This chapter explains servo amplifiers mounted MR-J4-T20.

⚠ WARNING	●To avoid an electric shock, only qualified personnel should attempt inspections. For repair and parts replacement, contact your local sales office.

⚠ CAUTION	●Do not perform insulation resistance test on the servo amplifier. Otherwise, it may cause a malfunction. ●Do not disassemble and/or repair the equipment on customer side.

5.1 Inspection items

It is recommended that the following points periodically be checked.

(1) Check for loose terminal screws of the servo amplifier. Retighten any loose screws.

(2) Check servo motor bearings, brake section, etc. for unusual noise.

(3) Check the cables and the like for scratches or cracks. Perform periodic inspection according to operating conditions.

(4) Check that the connectors are securely connected to the servo motor.

(5) Check that the wires are not coming out from the connector.

(6) Check for dust accumulation on the servo amplifier.

(7) Check for unusual noise generated from the servo amplifier.

(8) Check the servo motor shaft and coupling for connection.

5.2 Parts having service lives

Service lives of the following parts are listed below. However, the service life vary depending or operating methods and environment. If any fault is found in the parts, they must be replaced immediately regardless of their service lives. For parts replacement, please contact your local sales office.

Part name	Life guideline
Smoothing capacitor	(Note1) 10 years
Relay	Number of power-on, forced stop by EM1 (Forced stop), and controller forced stop times: 100 000 times
Cooling fan	10,000 hours to 30,000 hours (2 years to 3 years)
Battery backup time	Refer to "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual".
(Note 2) Battery life	5 years from date of manufacture

Note 1. The characteristic of smoothing capacitor is deteriorated due to ripple currents, etc. The life of the capacitor greatly depends on ambient temperature and operating conditions.
The capacitor will reach the end of its life in 10 years of continuous operation in normal air-conditioned environment (40 °C surrounding air temperature or less).
2. Quality of the batteries degrades by the storage condition. The battery life is 5 years from the production date regardless of the connection status.

6. Transportation and storage

⚠ CAUTION	●Transport the products correctly according to their mass. ●Stacking in excess of the limited number of product packages is not allowed. ●Install the equipment in a load-bearing place in accordance with "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual". ●Do not get on or put heavy load on the equipment.

When you keep or use it, please fulfill the following environment.

Item			Environment
Ambient temperature	Operation	[°C]	0 to 55 Class 3K3 (IEC/EN 60721-3-3)
	Transportation (Note)	[°C]	-20 to 65 Class 2K4 (IEC/EN 60721-3-2)
	Storage (Note)	[°C]	-20 to 65 Class 1K4 (IEC/EN 60721-3-1)
Ambient humidity	Operation, transportation, storage		5% to 90 %RH
Vibration load	Test values		10 Hz to 57 Hz with constant deviation of 0.075 mm 57 Hz to 150 Hz with constant acceleration of 9.8 m/s² (1 g) to IEC/EN 61800-5-1 (Test Fc of IEC 60068-2-6)
	Operation		5.9 m/s² (0.6 g)
	Transportation (Note)		Class 2M3 (IEC/EN 60721-3-2)
	Storage		Class 1M2 (IEC/EN 60721-3-2)
Pollution degree			2
IP rating			IP20 (IEC/EN 60529) Except terminal block and fan finger guard
			Open type (UL 50)
Altitude	Operation, storage		1000 m or less above sea level
	Transportation		10000 m or less above sea level

Note. In regular transport packaging

7. Technical data

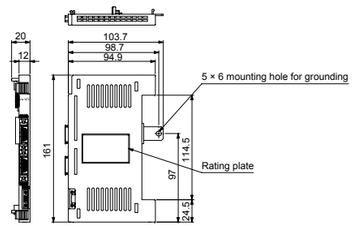
⚠ CAUTION	●When MR-J4-T20 is mounted, the STO function cannot be used.

7.1 MR-J4-T20

Model			MR-J4-T20
Control circuit power supply	Voltage		5 V DC (supplied from the servo amplifier)
	Rated current	[A]	0.1
Network interface			SSCNET interface (CN10A connector/CN10B connector)
Communication function	RS-232C		Connection to a personal computer (MR Configurator (MRZJW3-SETUP161 compatible) (CN30 connector))
Structure			Natural-cooling, open (IP rating: IP 00)
Pollution degree			2 (IEC/EN 60664-1)
Overvoltage category			III (IEC/EN 60664-1)
Protection class			I (IEC/EN 61800-5-1)
Mass		[g]	140

7.2 Dimensions

[Unit: mm]



[Warranty]

1. Warranty period and coverage
We will repair any failure or defect hereinafter referred to as "failure" in our FA equipment hereinafter referred to as the "Product" arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

[Term]

The term of warranty for Product is twelve (12) months after your purchase or delivery of the Product to a place designated by you or eighteen (18) months from the date of manufacture whichever comes first ("Warranty Period"). Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

[Limitations]

(1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule. It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
(2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
(3) Even during the term of warranty, the repair cost will be charged on you in the following cases.
(i) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
(ii) a failure caused by any alteration, etc. to the Product made on your side without our approval
(iii) a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
(iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
(v) any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)
(vi) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
(vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
(viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for

2. Term of warranty after the stop of production
(1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
(2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

3. Service in overseas countries
Our regional FA Center in overseas countries will accept the repair work of the Product. However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA center for details.

4. Exclusion of responsibility for compensation against loss of opportunity, secondary loss, etc.
Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsible, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

5. Change of Product specifications
Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

6. Application and use of the Product
(1) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.
(2) Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.
In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.
We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.